Alternating mixing tabs in multifunctional heat exchanger-reactor

Titre	Alternating mixing tabs in multifunctional heat exchanger-reactor
Type de publication	Article de revue
Auteur	Habchi, Charbel [1], Lemenand, Thierry [2], Della Valle, Dominique [3], Peerhossaini, Hassan [4]
Editeur	Elsevier
Type	Article scientifique dans une revue à comité de lecture
Année	2010
Langue	Anglais
Date	Jan-07-2010
Numéro	7
Pagination	653-661
Volume	49
Titre de la revue	Chemical Engineering and Processing: Process Intensification
ISSN	0255-2701
Mots-clés	Micromixing [5], Multifunctional heat exchanger/reactor [6], Process intensification [7], Static Mixer [8], Turbulence energy dissipation [9], Vortex generator [10]
Résumé en anglais	Streamwise vortices are used in many applications for mixing processes, fast chemical reactions and heat-transfer enhancement. In this work we studied experimentally and numerically the effects of vorticity field redistribution on the turbulence energy dissipation rate in a modified geometry of the high-efficiency vortex (HEV) mixer, in which the mixing tab arrays are periodically rotated by 45° to better distribute the vorticity field. Attention focuses on the evolution and distribution of turbulence energy dissipation, since this describes quantitatively the drop breakup and turbulent micromixing mechanism, which controls fast chemical reactions. It is found that redistribution of the vorticity field locally intensifies turbulent micromixing relative to the classical HEV mixer, producing a local mixing intensification of up to 120%. In addition, the alternating vortex generator arrays improve homogenization of the turbulence field in the mixer.
URL de la notice	http://okina.univ-angers.fr/publications/ua8618 [11]
DOI	10.1016/j.cep.2009.07.003 [12]
Lien vers le document	http://dx.doi.org/10.1016/j.cep.2009.07.003 [12]
Titre abrégé	Chemical Engineering and Processing: Process Intensification

Liens

[1] http://okina.univ-angers.fr/publications?f[author]=15323

[2] http://okina.univ-angers.fr/t.lemenand/publications
[3] http://okina.univ-angers.fr/publications?f[author]=15326
[4] http://okina.univ-angers.fr/publications?f[author]=15328
[5] http://okina.univ-angers.fr/publications?f[keyword]=14306
[6] http://okina.univ-angers.fr/publications?f[keyword]=14307
[7] http://okina.univ-angers.fr/publications?f[keyword]=14299
[8] http://okina.univ-angers.fr/publications?f[keyword]=14276
[9] http://okina.univ-angers.fr/publications?f[keyword]=14305
[10] http://okina.univ-angers.fr/publications?f[keyword]=14296
[11] http://okina.univ-angers.fr/publications/ua8618
[12] http://dx.doi.org/10.1016/j.cep.2009.07.003